DETAILED ACTION

This office action follows a response filed on December 10, 2007. Claims 4, 13, 14, 21, 22, 24-28, 37-39, 41-44, 47, 48, 50, 51, and 53-58 are pending.

Claim Objections

1. Claim 22 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claimed range is broader than that recited in independent claim 4.

2. Claims 39, 43, and 44 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claims recite the same limitation set forth in independent claim 37.

3. Claim 42 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 41. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

4. Claim 48 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim recites a range broader than that indicated in independent claim 47.

5. Claim 51 would be objected to under 37 CFR 1.75 as being a substantial duplicate of claim 50 unless the dependency of claim 51 is changed appropriately, especially in light of the fact that claim 51 depends from a claim that does not limit further the subject of the independent claim.

Claim Rejections - 35 USC § 102 / 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 4, 21, 22, 24, 25, 27, 37-39, 41-44, 47, 48, 50, 51, 53-55, 57, and 58 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Endriss (WO 95/17467; equivalent EP 684 971, cited in Applicant's IDS of December 10, 2007).

Endriss teaches a styrene copolymer composition comprising 30-90 wt % of styrene block copolymer, at least 5 wt % of resin, and 0-65 wt % of softening agent (claim 9). The softening agent is a medicinal white oil commercially available as Primol 352 (claim 7). This material has a kinematic viscosity at 100 °C of 9.5 cSt, a pour point of -15 °C, a Saybolt color of +30, a molecular weight of about 480, a content of mineral hydrocarbons with carbon number less than 25 of about 5 wt % and contains about 66 wt % of paraffins.[†] The reference is silent with respect to other properties recited in the claims, however, in light of the fact that the mineral oil is medicinal grade and meets the specifications of US FDA and US Pharmacopoeia, a reasonable basis exists to believe that it exhibits the claimed properties. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). While it is not clear that this product is produced by Fischer-Tropsch chemistry, it is well settled that where product by process claims are rejected over a prior art product that appears to be the

[†] Supplemental data furnished in Exxon Mobil Primol 352 product bulletin, 2005, pages 1-12; also available on the web at http://active.oil.hc360.com/lubebank//files%5Cupload255177439.pdf.

same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

8. Claims 4, 21, 22, 24, 25, 37-39, 41-44, 47, 48, 50, 51, 53-55, 57, and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agostinis *et al.* (U.S. 5,164,455).

Agostinis *et al.* discloses a styrene copolymer composition comprising 100 parts by weight (pw) of styrenic polymer, 170 pw of Esceprex 5380 resin, 20 pw of Primol 352, and 1 pw of antioxidants (Table 2). The composition contains 6.8 wt % of the white oil. This material has a kinematic viscosity at 100 °C of 9.5 cSt, a pour point of -15 °C, a Saybolt color of +30, a molecular weight of about 480, a content of mineral hydrocarbons with carbon number less than 25 of about 5 wt % and contains about 66 wt % of paraffins.† The reference is silent with respect to other properties recited in the claims, however, in light of the fact that the mineral oil is medicinal grade and meets the specifications of US FDA and US Pharmacopoeia, a reasonable basis exists to believe that it exhibits the claimed properties. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). While it is not clear that this product is produced by Fischer-Tropsch chemistry, it is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

The deficiency of Agostinis *et al.* is that the reference discloses the use of 6.8 wt % of white oil, while the present claims require 2-5 wt %. It is apparent, however, that the instantly claimed amount of 5 wt % and that taught by Agostinis *et al.* are so close to each other that the fact pattern is similar to the one in *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.

1990) or *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) where, despite a slight difference in the ranges, the court held that such a difference did not "render the claims patentable," or, alternatively, that "a *prima facie* case of obviousness exists where the claimed range and prior art range do not overlap, but are close enough so that one skilled in the art would have expected them to have the same properties."

In light of the case law cited above, and given that there is only a slight difference between the amount of 6.8 wt % disclosed by Agostinis *et al.* and the amount disclosed in the present claims and further, given the fact that no criticality is disclosed in the present invention with respect to the amount of 5 wt %, it would have been obvious to one of ordinary skill in the art that the amount of white oil recited in the present claims is but an obvious variant of the amounts disclosed in the prior art, and accordingly, one of ordinary skill in the art would have arrived at the claimed invention.

9. Claims 47, 48, 53, and 55-58 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Johnson *et al.* (DE 1 692 059; same patent family as GB 1,125,499, cited in Applicant's IDS, dated January 20, 2004).

Johnson *et al.* teaches a composition comprising styrene copolymer and 20-100 wt % of colorless paraffinic or mineral oil containing 0-25 wt % of aromatic hydrocarbons and exhibiting SSU at 100 °C of 40-65, corresponding to an upper limit of kinematic viscosity of 14.2 cSt (SSU = centistokes (cSt) X 4.55), and pour point between -12 °C and -45 °C. Compositions contain 20-100 parts by weight of oil per 100 parts of styrene copolymer (page 6). The reference is silent with respect to other properties recited in the claims, however, in light of the fact that the oil exhibits is a colorless paraffinic or mineral oil and contains minimal aromatic hydrocarbon, a reasonable basis exists to believe that it exhibits the claimed properties. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). While it is not clear that this product is produced by Fischer-Tropsch chemistry, it is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the

burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

10. Claims 13, 14, 37-39, 41-44, 47, 48, 50, 51, 53, and 55-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gapinski (U.S. 2004/0110647) in view of Trewella (U.S. 6,090,989).

Gapinski discloses a concentrate comprising a styrene/maleic acid copolymer and 10 wt % of lubricating oil (claim 9). According to the inventor, suitable oils are those that are prepared by Fischer-Tropsch synthesis (paragraph [0023]). Although not shown in the working examples of the disclosure, it would have been obvious to one having ordinary skill in the art to make a concentrate using a Fischer-Tropsch derived oil because this embodiment is taught by the inventor, and one of ordinary skill in the art would have expected such an embodiment to work. Gapisnki is silent with respect to the nature of the Fischer-Tropsch oil for practicing the invention. Trewella *et al.* discloses a Fischer-Tropsch derived lubricant oil having a kinematic viscosity at 100 °C of 7.9 cSt and a pour point of -42 °C (example 10). The combination of teachings would have suggested to one having ordinary skill in the art that the Fischer-Tropsch oil of Trewella *et al.* is suitable for use in compositions of Gapinski. Thus, it would have been obvious to one having ordinary skill in the art to use the product shown in Trewella *et al.* as the Fischer-Tropsch derived oil in the composition of Gapinski. Trewella *et al.* is silent regarding properties recited in the claims, however, in light of the fact that the initial Fischer-Trospch wax is formed from relatively pure synthesis gas containing little, if any, nitrogen or sulfur containing compounds in the gas phase (col. 4, line 67 - col. 5, line 5), a reasonable basis exists to believe that the oil in example 10 of Trewella *et al.* exhibits the claimed sulfur and nitrogen content, Saybolt color, and paraffin content. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

11. Claims 47, 48, 53, 55, 57, and 58 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gergen (U.S. 3,865,776).

Gergen teaches a styrene copolymer composition containing a minimum of 24 wt % of mineral white oil (claim 1). Compositions are prepared using a naphthenic white oil designated "A" in Table I. This oil exhibits SSU at 210 °F of 38, corresponding to a kinematic viscosity of 8.35 cSt (SSU = centistokes (cSt) X 4.55), a pour point of -55 °C, less than 0.001 % sulfur, an acid number of 0, and a Saybolt color of +30. The reference is silent with respect to other properties recited in the claims, however, a reasonable basis exists to believe that it exhibits the claimed properties. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). While it is not clear that this product is produced by Fischer-Tropsch chemistry, it is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

12. Claims 4, 13, 14, 21, 22, 24-28, 37-39, 41-44, 47, 48, 50, 51, 53-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masubuchi *et al.* (U.S. 6,106,011) in view of evidence furnished in Toyosawa *et al.* (U.S. 6,399,696, col. 15, lines 22-25), and Sakaki *et al.* (U.S. 6,723,776, col. 17, line 35).

Masubuchi *et al.* discloses a styrene copolymer composition comprising 100 pw of a mixture of styrene block copolymer, 25-60 pw of polyolefin, and 0-30 pw of a non-aromatic mineral oil (claims 1-4). In a preferred embodiment, the mineral oil is present in an amount of 0-4 pw (claim 5). A useful mineral oil is Diana PW-380 paraffin oil having a kinematic viscosity at 40 °C of 380 cSt (col. 17, line 65), a molecular weight of 750, and a pour point of -15 °C (col. 17, line 65). Although kinematic viscosity is reported at 40 °C, it is reasonable to believe that the

kinematic viscosity at 100 °C is above the claimed lower bound of 7 cSt. Also, a reasonable basis exists to believe that the paraffin oil exhibits the other properties recited in the instant claims. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). While it is not clear that this product is produced by Fischer-Tropsch chemistry, it is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

13. Claims 4, 13, 14, 21, 22, 24-28, 37-39, 41-44, 47, 48, 50, 51, 53-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forbes *et al.* (U.S. 5,565,163) in view of Germaine (U.S. 2004/0079678).

Forbes *et al.* teachs a biaxially oriented polystyrene sheet containing 3-10 wt % of food grade petroleum white oil (claims 11 and 12). According to USFDA regulation, food grade white oil must meet the requirements set forth in 21 C.F.R. 178.3620 (col. 3, lines 27-32). In particular, the regulation imposes strict limits on the level of unsaturated and aromatic contaminants, as well as sulfur-containing compound, which contribute to color of the oil (col. 3, lines 27-34). The reference does not describe physical properties of these food grade petroleum white oils.

Germaine discloses a Fischer-Tropsch derived base oil having a kinematic viscosity at 100 °C of 12-30 cSt and pour point of up to -10 °C (claims 10 and 11). Base oils have excellent potential to meet FDA § 178.3620 requirements (paragraph [0038] and [0043]). The combination of teachings would have suggested to one having ordinary skill in the art that Fischer-Tropsch derived base oils of Germaine is well suited for use in making polystyrene sheet because it meets the FDA requirement for food grade materials, as explained in Forbes *et al.* Therefore, it would have been obvious to one having ordinary skill in the art to use the oil

disclosed in Germaine for making polystyrene sheet as per Forbes *et al.*, and one of ordinary skill in the art would have expected the combination of teachings to work with a high degree of success.

Germaine is silent with respect to properties recited in the instant claims, however, due to the nature of the Fischer-Trospch process for making these oils, (for instance Germaine teaches that sulfur and nitrogen levels will generally be below 1 ppm (paragraph [0016]) and Fischer-Tropsch product contains at least 50 wt % of compounds having at least 30 carbon atoms (paragraph [0014])) a reasonable basis to believe that the oil exhibits the property recited in instant claims 26 and 28. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

14. Claims 4, 21, 22, 25, 27, 37-39, 41-44, 47, 48, 50, 51, 53-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forbes *et al.* in view of Endriss.

Forbes *et al.* teachs a biaxially oriented polystyrene sheet containing 3-10 wt % of food grade petroleum white oil (claims 11 and 12). According to USFDA regulation, food grade white oil must meet the requirements set forth in 21 C.F.R. 178.3620 (col. 3, lines 27-32). In particular, the regulation imposes strict limits on the level of unsaturated and aromatic contaminants, as well as sulfur-containing compound, which contribute to color of the oil (col. 3, lines 27-34). The reference does not describe physical properties of these food grade petroleum white oils.

Endriss discloses a styrene compatible, medicinal white oil commercially available as Primol 352 (claim 7). This material has a kinematic viscosity at 100 °C of 9.5 cSt, a pour point of -15 °C, a Saybolt color of +30, a molecular weight of about 480, a content of mineral hydrocarbons with carbon number less than 25 of about 5 wt % and contains about 66 wt % of paraffins.† The mineral oil is medicinal grade and also meets the specifications of US FDA 178.3620 and US Pharmacopoeia.

The combination of teachings would have suggested to one having ordinary skill in the art that the white oil of Endriss is well suited for use in making polystyrene sheet because it meets the FDA requirement for food grade materials, as explained in Forbes *et al.* Therefore, it would have been obvious to one having ordinary skill in the art to use the oil disclosed in Endriss for making polystyrene sheet as per Forbes *et al.*, and one of ordinary skill in the art would have expected the combination of teachings to work with a high degree of success.

Endriss is silent with respect to properties of the oil as recited in the instant claims, however, a reasonable basis exists to believe that it exhibits the claimed properties. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). While it is not clear that this product is produced by Fischer-Tropsch chemistry, it is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

15. Claims 37-39, 43, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gapinski in view of O'Rear *et al.* (U.S. 6,562,230) for the same reasons set forth in the previous office action dated June 7, 2007.

Response to Arguments

16. The rejection of claims over Migchels *et al.* (U.S. 6,451,865) alone or in combination with O'Rear *et al.*, set forth in the previous office action dated June 7, 2007, has been overcome by amendment or no longer applies due to cancellation of claims.

The rejection of claims over Gapinski no longer applies due to cancellation of claims. The rejection of claims 37-39, 43, 44 over Gapinski in view of O'Rear still applies. The rejection of claims 47, 48, 50, and 55-57 over Gapinski in view of O'Rear has been overcome by amendment.

The previous rejection of claims over Gapinski in view of Trewella *et al.* has been withdrawn, and a new rejection has been established in paragraph 10, *supra*.

The rejection of claims over Gapinski in view of Germaine has been overcome by amendment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Primary Examiner, Art Unit 1796

April 14, 2008